



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

21/D
2/27/03
Mullish

Applicants: Jonathan J. Wierer, Jr.; Michael R. Krames; Serge L. Rudaz
Assignee: Lumileds Lighting U.S. LLC
Title: Multi-Layer Highly Reflective Ohmic Contacts For Semiconductor Devices
Serial No.: 09/469,652 Filing Date: December 22, 1999
Examiner: Chris C. Chu Group Art Unit: 2815
Docket No.: 10992873-1
M-9197 US

San Jose, California
February 4, 2003

COMMISSIONER FOR PATENTS
Washington, D. C. 20231

RESPONSE TO OFFICE ACTION

Dear Sir:

This responds to the Office Action dated November 4, 2002. Please amend the above-identified application as follows.

IN THE SPECIFICATION

Please replace the paragraph starting on page 8, line 23 with the following replacement paragraph.

D' Figure 4 illustrates an alternate embodiment of the multi-layer contact 22 to a semiconductor device 20 with multiple contact layers 22A, 22B, and 22C. Ohmic layer 22A provides ohmic contact to semiconductor 21. A barrier metal layer 22B interposes the ohmic layer 22A and the reflector layer 22C. The barrier layer 22B is used to prevent diffusion of the ohmic layer 22A into the reflector layer 22C, thus preventing the creation of any inter-metallics. These inter-metallics could degrade the specific contact resistance and reflectivity of the contact and thus the efficiency of the device. This is a reliability issue that should be avoided for long lasting devices. The barrier metal layer should be kept thin, e.g. $< 100\text{\AA}$, to minimize light absorption and should be as reflective as possible to contribute to the reflectivity of the contact. Exact



02-06-03

2815

Brian D. Ogonowsky

Carmen C. Cook

David C. Hsia

Rachel V. Leiterman

February 4, 2003

Box: Non-Fee Amendment
Commissioner For Patents
Washington, D.C. 20231

Re: Applicant(s): Jonathan J. Wierer, Jr.; Michael R. Krames; Serge L. Rudaz
Assignee: Lumileds Lighting U.S., LLC
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Dear Sir:

Transmitted herewith are the following documents in the above-identified application:

- (1) This Transmittal Letter (1 page);
- (2) Response to Office Action (11 pages).

- ☒ No additional fee is required.
☐ The fee has been calculated as shown below:

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	Claims Remaining <u>After Amendment</u>		Highest No. Previously <u>Paid For</u>		Present <u>Extra</u>		<u>Rate</u>		Additional <u>Fee</u>
Total Claims	16	Minus	20	=	0	x	\$18	\$	0.00
Independent Claims	2	Minus	3	=	0	x	\$84	\$	0.00

- ☐ Fee of _____ for the first filing of one or more multiple dependent claims per application \$
- ☒ Conditional Petition for Extension of Time: If an extension of time is required for timely filing of the enclosed document(s) after all papers filed with this transmittal have been considered, an extension of time is hereby requested.
- ☐ Please charge our Deposit Account No. 502226 in the amount of 0.00
- ☒ Also, charge any additional fees required and credit any overpayment to our Deposit Account No. 502226.

Total: \$ 0.00

EXPRESS MAIL LABEL NO:
EV 211853950 US

Respectfully submitted,

R. Leiterman
Rachel V. Leiterman
Attorney for Applicant(s)
Reg. No. 46,868